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Sero-Diagnosis of Tuberculosis.—This is an extensive review of the literature from 1923 to date, incorporating also personal experiences with serodiagnostic methods in tuberculosis. The methods include the agglutination, especially that of Fornet, precipitation, flocculation and similar procedures, autoserum reactions, Abderhalden reaction, and complement-fixation tests with the Wassermann, Besredka, and other antigens. It is concluded that the complement fixation possesses a limited diagnostic value, which is not found with any of the other methods. In the complement-fixation test, however, the newer antigens have added nothing of value to recommend them above the earlier or older antigens. It is thought that the complement-fixation test should be used to a greater extent clinically.—*Ergebnisse oder Übersichtsberichte. Die Praktische Bedeutung spezifisch-serodiagnostischer Verfahren für der Tuberkulose. An der Hand der Literatur und der eigenen Erfahrungen, H. Schulte-Tigges, Centralbl. ges. Tuberkforsch., 1926, xxv, 417.*—(*H. J. C.*)

Colloidal Lability Reactions.—The sedimentation, Matefy and Lange silver-nitrate reactions proved serviceable, while the Daranyi and Klausner reactions were not sensitive enough. The advantages of the above reactions are speed of determination, evidence of activity of a tuberculous process, prognostic value, and orientation of therapeutic results. The drawbacks are nonspecificity, insufficient significance given

to the state of allergy, too marked reactions in exudative processes (pleuritis, peritonitis) with relation to the clinical pictures, and the occurrence of contradictory cases. The sedimentation reaction has the advantage of broad scope and delicate differentiation, but is influenced by the inconstancy of number and volume of the erythrocytes. The Matefy reaction is performed with the serum and is technically simple; but it is too sensitive, inasmuch as positive reactions occur in cases of inactive tuberculosis.—*Kolloidlabilitätsreaktionen bei Tuberkulose, M. v. Lemesic and V. Kosanovic, Beitr. z. Klin. d. Tuberk., 1925, lxii, 277.*—(*H. J. C.*)

Matefy Reaction in Pulmonary Tuberculosis.—The Matefy reaction, or flocculation of serum globulin by 0.5 per cent aluminum-sulphate solution, is of no practical utility in pulmonary tuberculosis, and results were very irregular.—*Über den Wert der Matefyschen Reaktion bei Lungentuberkulose, H. Rosenhagen, Ztschr. f. Tuberk., 1926, xliv, 321.*—(*H. J. C.*)

Digestive Hemoclasia in Tuberculosis.—The digestive hemoclasic-crisis test for hepatic function was performed on 12 patients in various stages of tuberculosis. A leucocyte count was done before and after the administration of 200 cc. of milk on a fasting stomach. The coagulability of the blood and the blood-pressure were not estimated. In 3 patients with slight apical infiltration and in good general condition the test was negative. Of 3 patients receiving pneumothorax therapy 2 were negative and one was positive. Six cases presented extensive bilateral lesions with cavitation, and their general condition was poor. Five of these reacted positively and one negatively. *Conclusions: 1:* A positive digestive hemoclasia in tuberculous patients is always an index of diminished liver function. *2:* A negative reaction is an index of good liver function. *3:* In the early stages of tuberculosis digestive hemoclasia is negative. *4:* It is also negative in those patients whose general condition is good. *5:* In advanced stages of the disease with emaciation the test is positive. *6:* It may be a prognostic index of great value in tuberculosis.—*L'emoclasia digestiva nei tubercolotici, Malcangi, Tubercolosi, January, 1926, xiii, 7.*—(*U. E. Z.*)

Prognosis of Tubercle of Choroid.—It has always been supposed that the development of tubercle in the choroid was a complete confirmation of the diagnosis of either generalized miliary tuberculosis or tuberculous meningitis, and that it indicated that death would very soon supervene. But occasionally, at least, death has not followed so promptly or inevitably. The case is cited of a child, a little older than one year, who was given an unequivocal diagnosis of chorioidal tubercle, tuberculids, and numerous foci of osseous tuberculosis, as well as a diagnosis of probable pulmonary tuberculosis. But one and one-half years after the appearance of the chorioidal tubercle, which was then quite well fibrosed and scarred, the child still lived, was afebrile, and was thought to have a reasonably good prognosis. The comparatively favorable prognosis of tubercle of the iris, especially among older children, is well known. The extraordinary difference between the prognostic significance in this and in chorioidal tubercle, however, may rest on neither a difference in pathogenesis of the tuberculous process nor a different reacting capacity of tissues, but on a failure of observation, for, in general, tubercle is rarely sought in the fundus except when one is suspicious of either generalized miliary tuberculosis or tuberculous meningitis. A tuberculous process in the iris, on the other hand, leads the patient promptly to the ophthalmologist. And if people, especially children, with multiple tuberculous foci were given an ophthalmological examination routinely, more evidence of healed chorioidal and miliary tuberculosis would probably be forthcoming.—*Zur prognostischen Bedeutung der Chorioidaltuberkel, J. Gehrt, Deutsch med. Wchnschr., May 7, 1926, lii, 794.*—(*H. S. W.*)

Myopia Due to Tuberculosis.—Myopia is due to tuberculosis, in that the toxins of the tubercle bacillus, according to Petruschky, are predominantly neurotoxins, and can affect all parts of the sympathetic nervous system, and thus in early life the short posterior ciliary arteries are affected through the sympathetic nerves. This results in a nutritive disturbance of the posterior half of the sclera, affecting intraocular pressure and leading to a typical myopic form of the eye-ball. Tuberculin treatment can be used for the prevention of myopia in children.—*Beziehungen zwischen Tuberkulose und Kurzsichtigkeit, G. Hirsch, Ztschr. f. Tuberk., 1925, xliv, 52.*—(*H. J. C.*)

Laryngeal Tuberculosis.—According to Blumenfeld, the following types of laryngeal tuberculosis are to be distinguished. First, infiltrative tuberculosis, which is a smooth, dense, pinkish or yellowish swelling, circumscribed or frequently diffuse, often it has a ring-like shape; it may be localized anywhere in the organ; dangerous collateral edema is

frequently associated. The second type is the tuberculous ulcer, which may develop from the first type; it has a dirty yellowish base, and irregular jagged borders, which are frequently undermined. It may be flat, or deeply penetrating. Third, the miliary tubercle, which is most frequently a part of a blood-borne generalized dissemination. The fourth type is a tumor-like tuberculosis, a process with marked fibrotic reaction. Next is mentioned tuberculous perichondritis, which is most frequently found about the arytenoid cartilages, and which often develops into an abscess; it is usually preceded by an ulcer, frequently secondarily infected and always intensely painful. The sixth form is laryngeal lupus, usually following cutaneous lupus and regularly of the descending type; it is characterized by faintly red nodules, which eventually coalesce and thicken the epiglottis, altering this part to monstrous shape. The nodules ulcerate frequently, and destroy the cartilage which may become denuded. This is the only form of tuberculosis of the larynx which may lead to the formation of stenotic scars, and which is usually associated with very little pain. Lesions of a transitional type are frequent. Combinations of tuberculosis with fibroma, papilloma, carcinoma, and especially with syphilis are observed.—*Aetiologie, pathologische Anatomie und klinische Formen der Kehlkopftuberkulose, K. Kaufmann, Die Tuberkulose, June 10, 1926, vi, 167.*—*(M.P.)*

Tuberculosis of Upper Respiratory Tract.—There have been a large number of publications recently upon this subject, and many of them have represented tuberculous structures quite differently from other writers. But the underlying factor which makes for unity of these disease reports is the fact that the anatomical structures in the different portions of the upper respiratory tract are different; hence the tuberculous tissues are represented as being different. Tuberculosis of the nose, for instance, may present itself as a solitary ulcer, a tuberculoma, diffuse infiltration, lupus, or miliary tuberculosis. The pathological anatomy, symptoms, differential diagnosis and treatment of these various forms of nasal tuberculosis, as well as of the nasopharynx, tongue and larynx, will therefore vary naturally with the nature of the process.—*Die Tuberkulose der oberen Luftwege, L. Joseph, Deutsche med. Wchnschr., May 14 & 21, 1926, lii, 839 & 880.*—*(H. S. W.)*

Diagnosis of Hilum Tuberculosis.—In the last weekly report of the Massachusetts State Health Department, published in the *Boston Medical & Surgical Journal*, appeared for the first time the item *Tuberculosis, hilum, 61 cases.* This means that this form of disease is now recognized as an entity, which can be more or less definitely diagnosed. Until 1910–1911 it was generally accepted that tuberculosis begins at the apex of the lung, especially the right, and lymph-node tuberculosis (thoracic) was considered of little importance. At present, however, the preponderance of evidence indicates that the first early clinical manifestations are in the hilum lymph nodes, whence the disease spreads upward and outward to the pulmonary parenchyma. At a meeting of the American Sanatorium Association in December, 1922, a committee headed by H. D. Chadwick defined the term *hilum tuberculosis*, and recommended its addition to the present classification, and the report was accepted at the annual meeting of the association in 1925. The term applies particularly to cases in children and includes the following criteria: *Symptoms:* Local, such as cough, hoarseness, loss of voice (usually transitory only); and constitutional such as undue fatigue, malaise, nervous irritability, anorexia, weight possibly subnormal, retarded growth, unexplained profuse sweating, unexplained brief febrile attacks, fatigue posture, phlyctenular disease, scrofuloderma and lupus. *Physical Signs:* Paravertebral dulness, usually without râles. *Roentgen-ray Findings:* (1) prominent bronchial trunks, beaded or nodular, extending from the hilum; (2) enlarged lymph nodes embedded in thickened hilum tissue; and (3) diffuse shadows of varying density throughout the hilum, or occasionally cloudy masses with irregular outlines projecting into the adjacent tissue (deep parenchyma). The present study is based on 2,285 cases, comprising a "reactor group" (positive Pirquet reaction) of 1,176 cases and a "nonreactor group" (negative Pirquet reaction) of 1,109 cases. The former group included 472 boys and 704 girls; the latter, 430 boys and 679 girls, all between 6 and 15 years of age. *Comparison of Symptoms:* According to the Baldwin-Wood weight-height-age tables, 64.3 per cent of the reactor group were underweight, compared to 49 per cent of the nonreactor group. Twenty-one per cent of the reactor group were 15 per cent or more underweight, and 11.7 per cent of the nonreactor group. Of 277 definitely diagnosed hilum cases, 76.5 per cent were underweight; of 426 suspicious cases, 71.8 per cent, and of 508 negative cases, 58 per cent. The next most constant symptom was a "tendency to tire easily," which occurred in 49.8 per cent of the hilum group, 31.6 per cent of the

suspicious group, and 20.4 per cent of the negative group. Between the reactor and the nonreactor groups there was little difference in the occurrence of this symptom (29.8 per cent and 26.9 per cent, respectively). "Nervousness" was present in 48.7 per cent of the hilum group, 42.7 per cent of the suspicious group, and 30.5 per cent of the negative group. *Comparison of Physical Signs:* Interscapular dulness was found in 74 per cent of the hilum group, 51 per cent of the suspicious group, and 27.7 per cent of the negative group. It was present in 42 per cent of the reactor group, as against 35 per cent of the nonreactor group. The factors in relative order of importance in diagnosis of hilum tuberculosis are (1) roentgen-ray evidence, (2) symptoms, and (3) physical signs. The tuberculin test must, of course, be positive. In the final analysis, however, all these factors are necessary for the diagnosis, for in only 4 per cent of cases was the X-ray alone sufficient for a diagnosis, and in none the physical signs or symptoms alone. *Roentgenological Findings:* These are expressed in a system of numerals devised by Chadwick and Morgan, based on the degree of density of the hilum shadows and the presence of additional densities, such as lymph nodes, primary foci, and fibrotic or calcified tubercles. Most significant, in the opinion of leading radiologists, are moderately dense and dense shadows at the hilum, especially with lymph nodes, intensified markings and calcified tubercles in the deep parenchyma, especially of the lower and mid-lung areas. *Tuberculin Reaction:* It is found that 29.2 per cent of children between 6 and 15 years of age react positively to the cutaneous (Pirquet) test. These figures are drawn from a State-wide examination of 10,648 children. Opinions vary as to its clinical significance in children over two years old. *Comment and Summary:* Among the symptoms, the first and most important is underweight. Other important symptoms are a tendency to tire easily, nervous irritability, frequent "colds," sweating, night-terrors, cough, and hoarseness. The chief physical sign is interscapular dulness, which was found in 74 per cent of the hilum cases, 51 per cent of the suspicious group, and 28 per cent of the negative; it occurred in 42 per cent of the tuberculin reactors and 35 per cent of nonreactors. It is best elicited by light percussion, and depends partly on the sense of palpation, reflex muscle-spasm causing a sense of resistance in the presence of active disease of the hilum nodes. Râles are of little importance in these cases; they occurred twice as often in the nonreactor group as in the reactors. It is interesting to note that 70 per cent of hilum and suspicious cases were marked "suspicious" by the examiners, before the result of either the X-ray or tuberculin tests were known. The most frequent roentgen-ray finding is a moderately thickened hilum, containing lymph-node shadows, with beaded linear markings extending into the deep parenchyma; and circumscribed discrete densities (calcified or fibroid tubercle or Ghon foci) are also important. The diagnosis of hilum tuberculosis in school children is based on a conservative evaluation of certain symptoms and physical signs, the exclusion of other diseases, and control by roentgen-ray examination and tuberculin test. By this method, 459 out of 10,648 children, or 5 per cent, were diagnosed as having hilum tuberculosis, a figure in exact agreement with Planner's findings among German school children.—*Hilum Tuberculosis: Relative Value of Symptoms, Physical Signs and Roentgen-Ray Findings in the Diagnosis of Bronchial Gland Tuberculosis, D. Zacks, J. Am. M. Ass., February 27, 1926, lxxxvi, 598.*—(*A. P.*)

Hilum in Tuberculosis.—The purpose of this paper is to emphasize a few findings of value in the roentgenographic diagnosis of certain forms of early or mild tuberculosis. In doubtful cases the roentgenologist should be accorded the advantage of a reëxamination before giving his final interpretation, just as the clinician often demands a longer period of time before he can be reasonably certain of his diagnosis. It is pointed out that if the clinician does not give due attention to "subliminal" symptoms, such as lack of cardiovascular tone, fatigue, irritability, insomnia and frequent chest-colds, he is continually at variance with the roentgenologist. Many foci reveal themselves as triangular areas of varying density, and, as the exudate clears, in cases of well developed allergy, there may be only small areas of actual tuberculous infection present. In others the exudation may precede caseation and cavitation, or the entire area may be invaded by fibrous tissue. When allergy is poorly developed the evidence of infection may be limited to the lymphoid follicles and nodes, which, in lungs irritated by tuberculous and tissue-toxins, produce furry densities (beading) along the pulmonic markings. These densities, especially when found in the pulmonary parenchyma, lead one to suspect a definite degree of irritative exudate, signifying an active process. In other cases there may be much irregular beading extending along the linear markings toward the hilum, and these markings may be increased in width and number with inter-

lacing toward the periphery. There is also a greater or lesser degree of clouding and broadening of the denser portion of the hilum shadow. These hilum changes are of special importance when we find increased parenchymal markings and cannot be certain that these show evidence of irritation. The thickened lung markings when directed toward a single suspicious area of parenchymal involvement are of certain diagnostic value. In early childhood a general increase of the hilum markings is more frequently noted with infection, but frequently a marked increase in radiating markings toward a single parenchymal zone will be found. Too great diagnostic importance should not be given a uniformly congested hilum with uniformly thickened radiating markings, since cardiac conditions, acute and chronic bronchitis, pneumonokoniosis, asthma, pertussis, bronchiectasis and other diseases may cause such changes. While the lymphatic system tends to become more "closed" with advancing age and there is a tendency to chronic hilum changes, localized vascular hilum change, pointing to congestion secondary to a parenchymal lesion, may be recognized. The importance of a thorough knowledge of the markings of healed lesions and of normal chests before deciding on degrees of abnormal lung markings is emphasized. Only stereoscopic plates showing the finest detail and good contrast should be used.—*The Hilum in Tuberculosis, A. G. Schnack, Am. J. Roentgenol. & Rad. Ther., May, 1926, xv, 424.*—(*E. H. K.*)

Hilum Tuberculosis in Adult.—Tuberculosis, occurring predominantly in the infraclavicular triangle, leaving the apices free, is to be differentiated from strict hilum tuberculosis. The former is designated as "mid-field" tuberculosis. This type of disease is recognizable primarily through physical clinical methods and not with the roentgen picture. Only thus can error be prevented. A constant catarrh in the hilum region in the adult almost always indicates a tuberculosis localized in this region. Spinalgia, and similar symptoms, have definite value only in conjunction with other clinical symptoms. Pleurisy at the base is frequently the expression of an active hilum tuberculosis, and occurs because of lymphatic extension of the inflammation. By diminishing the air-content, hilum changes often indirectly occasion a diminution of the percussion note over the apex, with somewhat sharper respiratory sounds, and a fogging of the apex in the roentgen picture. Subfebrile temperature, as well as general toxic symptoms, which are out of proportion to the slight findings, are characteristic of hilum tuberculosis. In the early stages there are changes in the pulse-rate, as well as disturbances of laryngeal innervation resulting from mechanical effects. Toxic albuminuria, occurring continuously or intermittently, is not infrequently seen.—*Über Hilustuberkulose bei Erwachsenen, H. Alexander, Beitr. z. Klin. d. Tuberk., 1925, lxii, 318.*—(*H. J. C.*)

Severe Tracheobronchial Lymph-Node Tuberculosis.—There was a markedly active bronchial and paratracheal lymph-node tuberculosis in a 16-year-old girl, with a pronounced febrile reaction, marked acceleration of the sedimentation rate, typical roentgen picture, and periodic rheumatic symptoms (Poncet's) of the hand and knee-joints.—*Ein Fall von hochgradiger aktiver Bronchialdrüsentuberkulose und Paratrachealdrüsentuberkulose bei einem 16-jährigen Kinde, K. Nüssel, Beitr. z. Klin. d. Tuberk., 1925, lxii, 505.*—(*H. J. C.*)

Severe Blood Changes in Tracheobronchial Lymph-Node Tuberculosis.—In a case of severe bronchial lymph-node tuberculosis in a 14-year-old patient with asthenic habitus, the temperature was between 37.5° and 38.5°. Roentgenologically, there were shadows in the Holzknecht space, and shadows to the right bordering on the vascular shadows. The Pirquet reaction was positive, and the blood findings were 40 per cent hemoglobin, 2 million erythrocytes, 26,100 leucocytes with numerous myelogenous forms, and 4200 blood platelets. Tapeworms were present in the stools. The case grew worse even after successful treatment for the worms. Death was not prevented by blood transfusion, and at postmortem there was found a widespread caseation of the hilum lymph nodes. The leukemic picture was attributed to the toxins elaborated by the caseated lymph nodes.—*Auffallende, schwere Blutbildveränderungen bei kindlicher Bronchialdrüsentuberkulose, O. Wiese and L. Hindersin, Beitr. z. Klin. d. Tuberk., 1925, lxii, 490.*—(*H. J. C.*)

Spontaneous Pneumothorax on Less-Diseased Side.—A case of spontaneous pneumothorax is described in which the rupture occurred on the less-diseased side. The case was a bilateral fibro-cavernous tuberculosis, involving the entire right lung and the left upper lobe and hilum, being of the acino-nodose type. There was also laryngeal involvement. The bilateral involvement with adhesions led to the consideration of a plastic operation. After seven weeks of treatment, pneumothorax occurred,

with high-grade cyanosis, high pulse, tympany over the entire left lung and depression of the diaphragm. Later, air was introduced, and after three weeks the pulmonary condition improved. The rupture occurred through a pleural focus, and it is recommended that a spontaneous pneumothorax be permitted to stand, in the hope of closing the pulmonary fistula. Subsequent additions of air may aid in this. If air must be removed it should never be brought to a negative phase because of the danger of again opening the old fistula.—*Ein Fall von Spontanpneumothorax auf der "falschen Seite," C. T. Zeitschel, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 102.*—(*H. J. C.*)

Mediastinal Pleurisy.—Mediastinal pleurisy has taken on, in the last few years, an increased interest because of improvements in roentgenological technique. A number of characteristic sketches and excellent roentgen pictures are presented, illustrating typical cases of mediastinal pleurisy and mediastinal-diaphragmatic pleurisy. A determination of this condition is not only of diagnostic interest, but assumes therapeutic significance in the determination and drainage of hidden effusions, which is not possible without exact topographical knowledge and orthodiagraphic roentgenological determination.—*Zur Kenntnis der Pleuritis mediastinalis, insbesondere der Pleuritis mediastinodiaphragmatica, E. Brieger and A. Schröter, Beitr. z. Klin. d. Tuberk., 1925, lxi, 58.*—(*H. J. C.*)

Treatment of Tuberculous Pericarditis with Lipiodol.—The patient shown had a purulent tuberculous pericarditis, the course of which appeared strikingly influenced by two intrapericardial injections of lipiodol. The infrequent association of pleural and pericardial tuberculous lesions is referred to.—*Péricardite purulente tuberculeuse traitée par les injections intrapéri. cardiques de lipiodol, N. Fiessinger and A. Lemaire, Meeting, Soc. Méd. d. Hôp. d. Paris, July 17, 1925, reported in Presse Méd., July 22, 1925, no. 58, 984.*—(*A. P.*)

Pathological Anatomy of Tuberculosis of Heart.—Cardiac tuberculosis in man has increased from 3 to 8 per cent since before the war, as determined by routine autopsy examinations. This increased incidence, especially in childhood, is probably due to the bodily changes wrought by starvation. In tuberculous myocarditis in cattle there is an epithelioid infiltration running parallel to the muscle-fibres, with proliferation of the endothelial cells of the capillary walls. After the destruction of tissue there occurs an influx of myophages, acting phagocytically upon the products of destruction. Fibroblasts proliferate and form the infiltration in tuberculous myocarditis of cattle, when there is a marked destruction of the muscle fibres. In both cattle and man there was no regeneration of the cardiac muscle.—*Beitrag zur pathologischen Anatomie der Herztuberkulose. Die Herztuberkulose des Menschen und der Tiere, W. Stefko, Ztschr. f. Tuberk., 1926, xliv, 199.*—(*H. J. C.*)

Tuberculosis of Stomach.—Tuberculosis of the stomach is a very rare condition because of (1) paucity of solitary lymph nodes, (2) intactness of the mucosa, (3) the presence of hydrochloric acid and (4) the mobility of the organ. In the few cases reported it has been a part of a general process and is a gastritis. The case reported here has been under observation for ten years. The patient had symptoms of pyloric stenosis and dilatation, such as retention of food, anorexia, flatulence, sense of pressure and pain in the epigastrium after meals, distention and thin stools. At laparotomy the gross diagnosis was either carcinoma or tuberculosis. The pylorus was thick and stenotic but soft, and there were numerous enlarged lymph nodes at the lesser curvature. Pyloric resection and posterior gastroenterostomy were done. Histologically, there was tuberculosis with caseation, giant cells, and in places fibrosis, throughout the tumor-like areas, and some gastric catarrh. In arriving at a clinical diagnosis of this disease, gastric analysis does not help, for it results the same as in carcinoma of the stomach. In the roentgenogram, if the tuberculous process is a tumor, it is diagnosed carcinoma; if not a tumor, it is called ulcer. The only certain method of diagnosis is through operation, and this should be done in any event. For treatment, early operative intervention is indicated, because it will prevent a subsequent stenosis, and it may prevent spread of the disease, especially to the peritoneum. General therapy is also to be employed. In the ten years that this patient has been under observation he has had *achylia gastrica*, but he has remained well and free from any signs or symptoms of tuberculosis.—*Zur Diagnose, Prognose und Therapie der primären Magentuberkulose, J. Severin, Deutsche med. Wchnschr., July 9, 1926, lii, 1168.*—(*H. S. W.*)

Early Diagnosis of Intestinal Tuberculosis.—A definite diagnosis may be very difficult, even at a stage when the actual lesions are very advanced and inoperable, while on the other hand severe functional

symptoms may accompany very slight lesions. Forty cases have been observed, supposedly operable and submitted to exploratory laparotomy. It is concluded that neither examination of the stools nor an isolated examination of the digestive tract suffices for a diagnosis, and that a complete clinical study is necessary, supplemented by abdominal radioscopy; finally, that only exploratory laparotomy can reveal the exact nature and extent of the lesions.—*Diagnostic précoce de la tuberculose intestinale, Burnand, xviiie Congrès Français de Médecine, July 16–19, 1925, reported in Presse Méd., August 19, 1925, no. 66, 1110.*—(*A. P.*)

Treatment of Intestinal Tuberculosis with Newer Methods.—Necropsy disclosures of healed or partially healed intestinal ulcers have led to the conclusion that, although intestinal lesions add greatly to the gravity of any case of tuberculosis, a considerable number of cases of enteric tuberculosis are nevertheless curable. In adults, bowel tuberculosis is practically always secondary, and enteric lesions are present in from 70 to 90 per cent of all cases of advanced pulmonary tuberculosis. The lung lesions may be very limited and but slightly active or, rarely, even entirely latent, and intestinal lesions sometimes appear as a sort of metastasis after the lungs have nearly healed. *Diagnosis:* The great frequency of this complication should be kept constantly in mind. If, then, in a case of pulmonary tuberculosis, a persistent rise or repeated exacerbations of temperature occur, either alone or associated with loss of weight, or if other general symptoms occur in the absence of some other reasonable cause, an intestinal complication should be suspected. Localizing symptoms include "indigestion;" nausea; flatulence; pain, frequently colicky, particularly after eating, of more importance if found over the lower abdomen and perhaps in the right lower quadrant; newly-developing, obstinate constipation or, in some cases, a tendency to pass nonformed stools or watery movements. Alternating constipation and looseness are not infrequent. Periodicity of symptoms is common. Localized tenderness adds suspicion. A mass is found in a few cases, especially in hyperplastic tuberculosis. X-ray study, conducted by screen and films, may show local or general hypermotility, spasm, irregular filling defects, or retention of the barium with occasional ballooning behind the obstruction. Roentgen evidence is of great value, and by correlating this with other findings it is usually possible to make a fairly conclusive diagnosis. *Treatment:* Strict bed-rest, for conserving the energy and to favor bowel stasis, is just as important as in the treatment of pulmonary tuberculosis. Regarding food, the aim is to supply bland, nonirritating articles in as adequate a quantity as practicable, but it is frequently impossible to maintain a nutritional balance. Despite this, it is even a greater mistake than in the treatment of pulmonary tuberculosis to force the diet, and in some cases a continuation of loss of weight is to be expected. When the disordered bowel has once recovered its function, the loss may cease and, later still, weight may be regained. When bowel laxity is pronounced, a diet consisting exclusively of sweetened condensed milk one part, and rice-water four parts, in quantities of from one to two quarts daily, may sometimes be used advantageously for a long period. Dried milk, *Ovaltine*, or *Cerealin* (Alberty food) may be tolerated when other foods give difficulty. Other, more ordinary antidiarrheal articles are allowed as circumstances warrant. Actinotherapy has wholly changed the outlook in these cases. Both sunlight and rays from the quartz burner are effectual. In using sunlight, Rollier's schedule is used as a basis, but greater caution is necessary in treating abdominal tuberculosis, particularly if there is evidence of peritonitis. In certain cases the lower limbs only are insolated for several weeks, and, if the pulmonary process is active, the chest is usually not insolated at all. It may be wise to lengthen the baths only two and a half minutes daily, particularly after the abdomen is reached. The maximum duration is from one to three hours daily, equally divided between front and back, but this has seldom been reached. If long exposures are made, the time is best divided into two or three shorter periods, which are less irritating to the skin and less fatiguing to the patient. In giving quartz radiations it is ordinarily not necessary to limit the first exposure to the lower limbs, but a similar rule is followed for determining whether or not to expose the chest. Thirty-inches distance, initial exposures and increments thrice weekly of from one to three minutes each on the front and back, up to a total of forty minutes, subsequently in some cases gradually lowering the lamp to twenty inches, are the exposure factors. The intravenous use of calcium chloride in doses of 5 to 10 cc. of a 10 per cent solution once or twice weekly has a favorable effect in responsive cases on pain and diarrhea. Surgery often yields good results in tuberculosis of the hyperplastic type, and this type is not especially suitable for light therapy. Pneumoperitoneum seems to check promptly the abdominal symptoms in some cases, and is a method of consider-

able promise which at least has palliative value. Failures in treatment are of course frequent, but 3 successfully treated cases are reported in detail as exemplifying what may be accomplished by nonsurgical means if the disease is not too advanced. Sunbaths were administered to one of these patients, and the others were given quartz radiations. A case of hyperplastic tuberculosis of the cecal region is cited, to show the curative effect of surgery in this type of the disease. *Conclusions:* It is now possible to make with reasonable accuracy, in most cases, a fairly early diagnosis of intestinal tuberculosis. The prognosis has been wholly changed; and, if the case is not too severe, treatment can be undertaken with considerable optimism. The essential measures are strict bed-rest, a suitable dietary, heliotherapy, which may be either natural or artificial, calcium treatment, and surgery, including pneumoperitoneum. Heliotherapy appears to have greatest value. Such measures yield good results in a majority of early cases. As asymptomatic entric tuberculosis is not uncommon, the possibilities of light radiation for prophylaxis, or for preventing the development of latent lesions into serious complications should not be overlooked. For this reason, if not contraindicated, light therapy is a worth-while procedure in all cases of pulmonary tuberculosis.—*Intestinal Tuberculosis with Special Reference to Newer Methods of Treatment, C. E. Atkinson, Clin. Med., June, 1926, xxxiii, 391.*—(*C. E. A.*)

Tuberculous Hydroappendix.—A young man of 23 for a year presented symptoms of chronic appendicitis, with two acute exacerbations. The abdomen was soft, but there was a large cord-like mass in the right iliac fossa. Operation revealed a large hydroappendix, partially adherent to the cecum and with enlarged tuberculous lymph nodes at the ileocecal angle.—*Hydroappendice tuberculeux, Patel, Meeting, Soc. d. Stomatologie, June 22, 1925, reported in Presse Méd., July 22, 1925, no. 58, 985.*—(*A. P.*)

Fistula-in-Ano and Tuberculosis.—Many physicians associate fistula-in-ano with tuberculosis of the lungs because the pulmonary lesion recurs following operation under general anesthesia. Proctologists emphatically state that they can recognize a tuberculous fistula at sight. Great confusion has resulted from a study of statistics. Melchior asserts that 61 per cent of fistulae are tuberculous. Watson places the figure at no higher than 3, Fishberg at 2, and Lawrason Brown at 3 per cent. Few of the cases were verified by pathological examination. An ischiorectal abscess or a fistula-in-ano may be proved tuberculous by finding tubercle bacilli in the discharge or in sections, and by animal inoculation with macerated tissue. By examining scrapings or sections for tubercle bacilli in 5,000 cases of fistula, Gant found that not less than 10 per cent were tuberculous. Gabriel examined 75 cases, and found 9 per cent with tubercle bacilli in the sections; half of the positive cases showed no evidence of pulmonary tuberculosis. In men over forty years of age pathological examination is necessary to determine the character of the fistula. The formation of fistula-in-ano, not due to trauma or new growth, involves suppuration in one of the ischiorectal fossae. The terms ischiorectal abscess and fistula-in-ano are used interchangeably with little discrimination. A fistula is regarded as the chronic form of an ischiorectal abscess. A study of the reports made by Powell and Hartley, Melchior and others, reveals that fistula is thirteen times commoner in male tuberculosis patients than in the nontuberculous. In 61 out of 109 cases of fistula with pulmonary tuberculosis, the fistula preceded the diagnosis of the lung lesion; in 5 cases the records failed to show which condition appeared first; and in 43 cases pulmonary tuberculosis was diagnosed before the fistula developed. In 29 cases operation for fistula was done before the tuberculous condition of the patient was recognized; and in 17 of these cases manifest pulmonary tuberculosis appeared within three years after the operation. There was no history of operation in 32 cases. Under operative treatment 47 cases improved, 7 remained stationary, 3 became worse, and 4 died. Fistula is commonly associated with a very chronic type of pulmonary lesion, and indicates a relatively favorable prognosis. *Conclusions: 1:* Ischiorectal abscess and fistula-in-ano occur in males about eight time more commonly than in females. *2:* About 5 per cent of male cases of pulmonary tuberculosis are associated at some time with an ischiorectal abscess or a chronic fistula. *3:* The fistula or abscess may precede the signs in the lungs by years. *4:* Sixty-one per cent of the cases of fistula subsequently develop pulmonary tuberculosis. *5:* Fistula occurs thirteen times more commonly in tuberculous than in nontuberculous males. *6:* About 5 per cent of fistula can be proved tuberculous by histological examination. *7:* Recently 20 per cent of cases of fistula have been proved tuberculous by animal inoculation. *8:* It is not always possible to distinguish by inspection between a "simple" fistula and

a tuberculous one. *9:* Pulmonary tuberculosis should be rigorously excluded in every case of fistula before surgical treatment is considered.—*A Note on the Relationship of Ischiorectal Abscess and Fistula in ano to Pulmonary Tuberculosis, B. R. Clarke, Tubercle, March, 1926, vii, 277.*—(*U. E. Z.*)

Climatic Treatment of Surgical Tuberculosis in Children.—A sanatorium on the island of Föhr in the North Sea has demonstrated the value of that climate in the treatment of surgical tuberculosis. Patients are carefully selected, none with pulmonary tuberculosis being admitted. But children with asthma or upper respiratory disease or invalids, in addition to those with such tuberculous affections as scrofula, scrofuloderma and bronchial-node tuberculosis are taken into the institution. Treatment must therefore be both general and local, or specific and medical and surgical. The children come for a nine weeks' residence, and occasionally they are kept for eighteen weeks, and the results seem quite as good as those in patients who live in sanatoria in high altitudes. Exposure of the children to sunshine and air constitutes one of the most important features of the treatment: the general stimulation from sun, light and air is the important feature of the treatment. Hyperemia (from the sun) is helpful in local foci of tuberculosis, but not in the more general conditions. Bier's hyperemia, as well as sunlight, was used in some cases.—*Klimatische Behandlung der chirurgischen Tuberkulose an der Nordsee, O. Gundermann, Deutsche med. Wchnschr., March 19, 1926, lii, 480.*—(*H. S. W.*)

Biological Diagnosis of Surgical Tuberculosis.—The results of Moro's inunction method in early childhood were good, tuberculous children being in most cases positive. Less favorable were the results with the Haag modification of the intracutaneous test. This cannot be substitued for the subcutaneous test. Favorable results were obtained with *Tebeprotin*. A total of 600 cases were divided into 3 groups. In the first were 69 cases with definite tuberculosis demonstrated histologically and by animal inoculation. In 57 there occurred a local and general reaction, in 33 per cent an undoubted focal reaction, and in 17.5 per cent the reaction was questionable. In the second group there were 80 patients which at first had possible diagnosis of tuberculosis, but later this diagnosis proved to be incorrect. In 70 of these cases there was no febrile reaction after injection, while in 10 there was fever, the source of which could not be determined. In the third group were 55 cases, which, clinically and by other methods of examination, were definitely tuberculous. In 50 of these cases there was a febrile reaction with definite focal reaction in 55 per cent. Among 16 of these cases, in which nephrectomy proved the presence of renal tuberculosis, 10 were positive and 6 negative. A negative animal test was obtained in 2 cases. Among 42 cases of surgical tuberculosis the findings were not in accord. The findings with the Wassermann complement-fixation test in 300 cases did not show it to have advantages over earlier methods. Of 90 definite tuberculous cases only 65 per cent were positive, and clinically healthy individuals not rarely gave positive reactions. There was also a changeable reaction upon repetition of the test. Fornet's agglutination test was found to give agglutinations at 1 to 100 and frequently at 1 to 200 dilution with sera regardless of whether the sera came from normal or diseased individuals. The Kümmel modification of the Wildbolz autogenous urine reaction proved of little value in 50 definite tuberculous cases and in tests on healthy individuals. The flocculation reaction of Mündel and Matefy was unserviceable in surgical tuberculosis.—*Die biologische Diagnostik der chirurgischen Tuberkulose, H. Friedrich, Arch. f. klin. Chir., 1925, cxxxvii, 667.*—(*H. J. C.*)

Colloidal Relations of Blood Serum in Surgical Tuberculosis.—The physical-chemical properties of the blood and serum in surgical tuberculosis in a series of 60 cases of varying activity and disease course, and 10 healthy individuals, were studied. Electrical conductivity is dependent upon the contained electrolytes. The nonelectrolytes primarily the proteins, lowered the electrical conductivity. In the majority of cases there was a diminution of electrical conductivity in the undiluted serum, as well as a diminution of the grades of dissociation. The latter was found lower as the process was more active and extensive. The diminution of electrical conductivity might be explained as due to a diminution in the protein content of the serum, but in severe cases conductivity is increased and, therefore, further experiments seem desirable. In the severe cases, aside from an increase in the protein, there was also an increase of globulin over the albumin fraction. The isoelectric point of the proteins was determined by the Goldberg modification of the Michaelis method, and it was found that there was an extension of the zone of serum-protein precipitation to the right and left, paralleling the degree of activity of the process. This is believed to be due to an oversaturation of the plasma

with carbonic acid, which would indicate a greater ionization of the serum-protein. This reaction is also an indirect method for determining acidosis in tuberculosis, that is, an increase not only of the soluble acids but also of the negative colloids. The extension of the zone of serum-protein precipitation affects primarily the globulin of the serum. The common idea that the globulin fraction is responsible for the sedimentation of the erythrocytes is verified by these experiments. The sedimentation rate parallels the severity and activity of the process, as well as the size of the globulin fraction. The calcium-content of the serum in severe cases was markedly diminished over that in the improved cases. It is hoped that a better understanding of the physical-chemical properties of the body may lead to the institution of methods for stabilizing colloidal relations.—*Zur Analyse des hämoklinischen Status des Kranken mit chirurgischer Tuberkulose, A. Schanin and W. Chrennikow, Beitr. z. Klin. d. Tuberk., 1926, lxii, 759.*—(*H. J. C.*)

Spontaneous Fracture in Tuberculous Osteitis of Ribs.—Two cases of spontaneous fracture of a rib weakened by tuberculous osteitis are reported. This complication is rather unusual, having occurred only twice in 33 operative cases of the author, and eight times in 110 cases reported by König. Usually the involvement of the bone does not extend very deep. Only when the process has advanced to the central portion is fracture likely to occur. This was found to be the case in the present instances after a section of involved rib was removed at operation. Since both cases in the present report were men of 65 years, it is possible that rarefaction of the spongy tissue further favored the production of fracture.—*Osteite tuberculeuse des côtes avec fracture spontanée, Lenormant, Presse Méd., August 5, 1925, no. 62, 1042.*—(*E. H. K.*)

Treatment of Bone and Joint Tuberculosis.—Special institutions are the best places for the treatment of bone and joint tuberculosis. This is not only true for purely conservative treatment, but also for operative cases. Economic considerations largely determine whether conservative or operative procedures are to be employed.—*Bemerkungen zur Behandlung der Knochen- und Gelenktuberkulose, E. Rüscher, Ztschr. f. Tuberk., 1925, xliv, 45.*—(*H. J. C.*)

End-Results of Albee Operation for Cervical Pott's Disease.—The graft in this case ran from the occipital to the first dorsal region. Pain was abated, but otherwise the result was orthopedically unsatisfactory, with marked disability, due to a total rigidity of the neck and complete atrophy of its posterior muscles, making it impossible to move the head. It is questioned whether conservative treatment might not have yielded better results.—*Résultat éloigné d'un Albee total du cou pour mal de Pott cervical, Santy, Meeting, Soc. d. Chir. d. Lyon, June 18, 1925, reported in Presse Méd., July 11, 1925, no. 55, 937.*—(*A. P.*)

Albee Operation for Dorsolumbar Pott's Disease.—A patient was operated on over three years previously, after having spastic paraplegia and total impotence, and being vainly treated nine years by decubitus rest and plaster corsets. After intervention, improvement was rapid, but after three years the patient again complained of pains at the site of the old lesion. The good results of Albee's method are emphasized.—*Greffe d'Albee pour mal de Pott dorso-lombaire, Patel and Creyssel, Meeting, Soc. d. Chir. d. Lyon, June 18, 1925, reported in Presse Méd., July 11, 1925, no. 55, 937.*—(*A. P.*)

Operative Treatment of Pott's Disease by Implantation of Bone.—In 7 cases of Pott's disease the Henle operation was used in 2, the Albee in 3, and the Kausch in 2. Results were good in all cases, one being able to return to work as a servant 4 months after operation and being entirely free from symptoms 5 years later. The Henle operation is believed superior to the Albee. The Kausch modification is to be preferred in cases with marked gibbus.—*Knocheneinpflanzung bei Wirbeltuberkulose, B. Kipnis, Deutsch. Ztschr. f. Chir., 1926, cxciv, 325.*—(*H. J. C.*)

Tuberculosis of Sacroiliac Joint.—This condition, most frequently seen in young adults and apparently rare in children, is generally considered as uncommon, there being, according to Ridlon, probably not one case to a hundred of tuberculous hip. The sacroiliac articulation, a "diarthrosis" formed by the opposing articular surfaces of the sacrum and ilium, is a true joint, with thin anterior capsular ligaments but strong posterior ligaments, which suspend the sacrum and weight of the superimposed trunk from the innominate bones. The pathological changes are similar to those produced by tuberculosis in other joints. The disease usually begins in the sacrum or ilium, more frequently the former. It may be arrested early, with resulting obliteration of the joint, *caries sicca*, or porgress to destruction

of the joint surfaces, with perforation of the capsule and the formation of a cold abscess. Perforation is usually anterior through the weakest part of the capsule into the pelvis, from which it may extend into the gluteal region, the groin or ischiorectal fossa, or rupture into the rectum. Symptoms include pain, limitation of motion, swelling, peculiar attitudes in standing and walking, and a feeling of insecurity of the back. Pain occurs early and may be localized, or, because of the proximity of the lumbosacral part of the cord, referred to areas supplied by the sciatic nerve. Tenderness is frequently noted on direct pressure over the joint, but not along the sciatic nerve, as in sciatica. Raising of the leg, with the knee joint extended, is definitely limited. Further flexion of the thigh causes pain referred to the sacral region or legs (Goldthwait sign). With the patient seated, bending forward is not restricted as in lumbosacral disorders, but is markedly so when the patient stands, because of the leverage exerted on the pelvis by the hamstring muscles. In making a differential diagnosis certain anatomical variations must be considered, as for instance: *1:* Abnormal relations of the fifth lumbar vertebra and sacrum. *2:* Differences in planes of articulating facets between the fifth lumbar vertebra and sacrum. *3:* Anatomical defects in the neural arch of the fifth lumbar vertebra. *4:* True spondylolisthesis. *5:* Abnormally long or broad transverse processes of the fifth lumbar vertebra impinging on the wing of the ilium or sacrum. *6:* Calcification of the ligaments from the last lumbar vertebra to the ilium. Lesions of the sacroiliac joint to be differentiated include, (1) nontuberculous arthritis, (2) relaxation, (3) strain or subluxation, and (4) malignant disease. Those of neighboring structures are (1) tuberculosis of the hip, (2) tuberculosis of the lumbar spine, (3) sciatica, (4) infections and malignant disease of adjacent bones, (5) sprain of the lower back, (6) arthritis of the spine, and (7) disease or displacement of the pelvic organs, or defective posture producing backache. History, insidious course with moderate severity of symptoms, and roentgen findings are very important in ruling out many of the conditions. Positive roentgen findings are dependent on destructive bone changes, and should be noted relatively early. The disease is one of marked chronicity, requiring prolonged treatment, and has an unfavorable prognosis. A suitable brace or plaster-cast should be worn to protect the diseased joint. Ankylosis may be performed by operation if abscess has not formed. Abscess must be treated by incision, removal of diseased structures, and drainage. A case report is included in the article.—*Tuberculosis of the Sacroiliac Joint, C. J. McCullough, Am. J. Roentgenol. & Rad. Ther., February, 1926, xv, 150.*—(*E. H. K.*)

Diagnosis of Tuberculous Coxitis.—A case of Perthes' disease is reported that came under observation with a diagnosis of tuberculous coxitis on account of the marked limitation of motion and pain. The roentgen picture, however, showed a typical *osteochondritis juvenilis* (Perthes). Fourteen days' rest, with extension brought about a disappearance of the symptoms which were probably caused by overexertion.—*Zur Differentialdiagnose der Coxitis tuberculosa, Kremer, Beitr. z. Klin. d. Tuberk., 1925, lxi, 770.*—(*H. J. C.*)

Surgical Treatment of Old Tuberculosis of Hip Joint.—A man, aged 28, had had tuberculosis of the hip joint at age 4. There was total destruction of the head and neck of the femur, with 5.5 inches of shortening. The patient had not walked for about eight years. Traction was applied, and the trochanter pulled down to the level of the acetabulum, and the stump of the femur was reamed into the iliac bone. The leg was immobilized in a cast at 20 degrees abduction. The patient can now sit in a chair with comfort, and can abduct his leg about 15 degrees.—*Old Tuberculosis of the Hip Joint, with Complete Destruction of Head and Neck. Marked Upward Displacement, W. L. Sneed, Am. J. Surgery, Anaesthesia Supplement, January, 1926, xl, 7.*—(*H. S. W.*)

Tuberculous Synovitis of Knee.—A young Arab with a positive Wassermann reaction failed to respond to specific treatment for a severe synovitis of the knee with an enormous pus pocket under the quadriceps muscle. No lesion of the epiphysis or diaphysis could be demonstrated. Only after the removal of a piece of involved tissue was the true nature of the process discovered. Animal inoculation was positive for tuberculosis. It is not entirely clear whether the process was simple synovitis opening into the region under the quadriceps, or an external tuberculoma near the synovial membrane opening into it.—*Tuberculose synoviale du genou, Madranges, Meeting, Soc. d. Chir. d. Marseille, May 25, 1925, reported in Presse Méd., August 1, 1925, no. 61, 1033.*—(*E. H. K.*)

Herpes Zoster and Tuberculosis.—Two types of herpes zoster are known, the idiopathic and the secondary. The first is generally considered as an acute infectious disease, because of its striking similarity to

acute anterior poliomyelitis, pathologically and epidemiologically. However, since this form is very rare, it is doubtful whether it should be regarded as an acute infection. Secondary herpes zoster occurs as the result of various pathological processes involving the spinal ganglia; for instance, tumors, tuberculosis, and pleuritic scarring. The eruption is a reflex phenomenon due to pathological changes in the internal organs. The course of the reflex is as follows: organ, sympathetic centripetal nerve, spinal ganglion, posterior horn, and the vasomotor centrifugal nerve to the skin. The lungs are supplied by the third and fourth cervical zones and the third to the ninth dorsal zones. The vagus and the trigeminal nerves are in the same relation as the sympathetic system and the sensory cutaneous nerves. The association of tuberculosis with herpes zoster has been frequently reported in the literature, and about one-half of the reported cases that came to necropsy showed a tuberculosis, especially of the lungs. The incidence of herpes zoster among 1,500 patients, during or immediately before residence in the Vifilsstadir sanatorium, was 0.7 per cent. The first case reported was that of herpes zoster of the palate and tongue, with facial paralysis and occurring in a patient with bilaterial apical infiltration. The eruption followed a Ponndorf vaccination with tuberculin. The condition was provoked by the tuberculin or the products of the reaction between the tuberculin and the tissues. Another patient with bilateral apical tuberculosis, developed herpes on the right side the day following an injection of Koch's bacillary emulsion. In 7 cases the eruption appeared over the areas, the reflex connections of which corresponded to the lung or pleura most affected. Two patients with intestinal tuberculosis developed herpes in the corresponding reflex zones. *Conclusions:* In all cases the eruption was probably caused by tuberculosis or tuberculous toxins. The herpes occurred in both benign and severe cases and it seems, therefore, to be of no prognostic importance.—*Herpes Zoster and Tuberculosis, S. Magnusson, Tubercle, July, 1925, vi, 482.*—(*U. E. Z.*)

Genitourinary Tuberculosis.—This type of tuberculosis is twice as common in men as in women, due to the more intimate relationship between the genital and urinary systems in the male. It occurs most frequently between the ages of 20 and 40. An active focus of tuberculosis can be found elsewhere in the body in 5 per cent of the cases. Primary involvement of the kidneys occurs in 75 per cent of the cases, of the testes in 20, and of the prostate in 5 per cent. A primary lesion in the bladder has rarely been reported. *Urinary Tuberculosis:* In 92 per cent of the cases one kidney is diseased first. The disease then extends to the bladder and may ascend to the other kidney. About 70 per cent of the patients dying of urinary tuberculosis show involvement of both kidneys. Infection of the first kidney is hematogenous and involvement of the second is through vesical and ureteral extension. In the kidneys the disease begins either at the apices of the papillae or at the corticomedullary junction. In the former pus and bacteria appear in the urine early; in the latter they may be absent for a long time. When the pelvis of the kidney and the ureter are diseased, there is a marked tendency to fibrosis, which leads to a narrowing or even occlusion of these channels. This is of importance in symptomatology, as it causes the tuberculous focus to be shut off from the lower urinary tract. Pathologically there are three types of renal tuberculosis: (1) the *ulcerocavernous*, in which pus is present in the urine and kidney may be little, if at all, enlarged; (2) the *hydronephrotic*, in which the kidney is enlarged and pus is present in the urine intermittently, and (3) the *caseous*, in which no urinary changes may be present. *Symptoms:* When the disease is confined solely to the kidney, there is slight aching in the loin and, occasionally, frequent, painless micturition due to the secretion of urine of a low specific gravity. An attack of hematuria may precede, by months or years, all other symptoms. Presence or absence of renal enlargement depends upon the pathological type of disease. Local tenderness is rare. When the bladder becomes involved there is frequent, painful and urgent micturition, leading, in children, to incontinence. A trigone involvement produces severe pain at the end of the act. When the bladder-wall is diseased, there may be only frequency, with pain, at the beginning of urination. Secondary infection, if super-added, aggravates the condition and hastens the course of the disease. These symptoms are found in any urinary infection and are, in no way, characteristic of tuberculosis. The patient may be well-nourished, because most of the toxins are excreted and not absorbed as in other lesions. The diagnosis is made from the presence of tubercle bacilli in the urine and by cystoscopic examination. The deposit from a twenty-four hour specimen should be examined, especially when the bladder symptoms are most severe, since it is possible that at such a time the kidney is discharging freely. Repeated examinations may be necessary. Cystoscopy may reveal ulcers or tubercles in any part of the bladder wall, although they are usually most marked

around the ureteral orifice of the diseased side. If 5 cc. of a 0.4 per cent solution of indigo-carmine are injected intravenously, excretion from the diseased kidney will be delayed. Guinea-pig inoculations are sometimes necessary. Death occurs from renal failure. Healing by fibrosis is never seen in the kidney as in the lungs. There may be an apparent arrest of all symptoms and signs, but in these cases there frequently occurs a complete encapsulation of the kidney by fibrous tissue, and autonephrectomy follows. Later, symptoms recur and the other kidney becomes involved. *Treatment:* Hexamine only aggravates symptoms. Tuberculin causes some relief of symptoms, sometimes promptly, but recurrence usually follows. It may be of advantage in bilateral renal tuberculosis. With one healthy kidney, the diseased organ may be removed, but a diagnosis of a contralateral normal kidney should be made very carefully. If the urine drawn from the healthy kidney contains no pus or bacilli and a large percentage of urea is present, then nephrectomy is indicated. If any doubt exists renal-function tests should be carried out. The immediate operative mortality from nephrectomy is less than 3 per cent. Persistent, painful and frequent micturition after operation is due to sclerosis of the bladder-wall or hypersensitiveness of the vesical mucous membrane. If disease in the lung is active and spreading, operation is out of the question. Subacute and chronic cases must be judged on individual merits. *Genital Tuberculosis:* Primary disease usually begins in the epididymis, then spreads to the body of the testis, prostate and opposite testis. Removal of one does not prevent spread to the other testicle. Removal of both should never be carried out, because of the grave metabolic disorders following such a procedure and the tendency to miliary tuberculosis. Treatment consists in generally hygienic measures, tuberculin, and rest by a suspensory. If abscesses form, incision is indicated. When the disease becomes chronic, epididymectomy may be performed. When the testis has become completely destroyed, removal is the procedure of choice. In acute tuberculosis of the testis, rest in bed is absolutely necessary until the inflammation subsides. *Conclusions: 1:* Persistent cases of cystitis should lead to a suspicion of tuberculosis. *2:* Once urinary tuberculosis has been diagnosed and one kidney has been proved healthy, removal of the diseased kidney is immediately called for. *3:* In primary genital tuberculosis, conservative measures should be tried first; operation should be restored to only if the conditions persist or the lesions tend to break down.—*Tuberculosis of the Genitourinary System, T. E. Hammond, Tubercle, July, 1925, vi, 490.*—(*U. E. Z.*)

Influence of Genitourinary on Pulmonary Tuberculosis.—In all cases of genitourinary tuberculosis there was a more or less pulmonary tuberculosis. In the majority of these cases the pulmonary process was stationary and limited. In the cases of extensive pulmonary tuberculosis genitourinary tuberculosis was rarely found.—*Über den Einfluss der Tuberkulose der Harn- und Geschlechts-Organe auf den Verlauf der Lungentuberkulose, W. J. Roshdestwensky, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 112.*—(*H. J. C.*)

Complement Fixation in Genitourinary Tuberculosis.—While complement-fixation reaction has taken an important place in clinical considerations of pulmonary tuberculosis, few results have been published as to its value in tuberculosis of the genitourinary tract. This paper is based on a study of this reaction in 169 cases on the urological service of Val-de-Grâce. These cases are divided into four groups: *1:* Proved renal tuberculosis by demonstration of bacilli, positive animal reaction, or microscopic study of tissue removed. *2:* Various urinary affections. *3:* Genital tuberculosis. *4:* Nontuberculous genital affections. Of 51 cases in group 1, the reaction was positive in 46, or 90 per cent. Feebly positive reactions in 5 cases are included in this percentage on the grounds that a series of tests of these cases would show increasingly positive reactions. Negative reactions occurred chiefly in those with active and severe disease elsewhere or rapidly advancing local disease. Concurrent Wassermann reactions were negative in all except one who had definite tertiary syphilis. Objections may be raised that disease elsewhere, particularly pulmonary tuberculosis, is sufficient to cause the positive reactions, but after discarding the 11 cases in which there was definite evidence of tuberculosis outside of the genitourinary tract, the percentage with positive complement fixation remains 92.5 per cent. Of 68 cases in group 2 (pyelonephritis, chronic nephritis, tumor, calculus, hematuria, hydronephrosis) 18, or 26 per cent, gave positive reactions. Of these, 5 were strongly positive and 9 feebly positive. In a number of these, definite diagnosis could not be made, and though the history may have suggested tuberculosis, the laboratory findings had been negative. Omitting those cases in which tuberculosis may have been suspected but not proved, the remaining posi-

tives totaled 12 per cent. Of 36 cases in group 3 (orchitis and epididymitis, with or without prostatitis and cystitis) there were 15, or 41 per cent, that gave positive reactions. Omitting those with long-standing, fibrosed lesions and including only 22 with active disease, the percentage of positives was raised to 68. The intensity of the reaction was in general weaker than in those with renal tuberculosis. Though there were several positive reactions in 14 cases under group 4 (hydrocele, cystitis, gonococcal orchitis, etc.) these could be explained on the basis of an unrecognized tuberculous focus. While the reaction of complement fixation should not be considered as sufficient to establish a diagnosis alone, and while it may seem useless when tubercle bacilli have been demonstrated, the results obtained, especially in renal tuberculosis, justify the conclusion that in doubtful cases, when a long wait for the result of animal inoculation is necessary, the clinician should consider it of primary importance.—*La réaction de fixation du complement dans la tuberculose de l'appareil genito-urinaire, J. Maisonnet and H. Merz, Presse Méd., August 26, 1925, no. 68, 1140.*—(*E. H. K.*)

Treatment of Renal Tuberculosis.—This is a summary of the results obtained from 1901 to 1923 in the treatment of renal tuberculosis in the surgical clinic of Upsala. There were 150 cases, and nephrectomy was performed on 121 of these. Of the cases that were not operated upon there, four are still alive, and all these have suffered prolonged urinary complications, while of those operated upon 52.3 per cent are well and self-supporting, 8.3 per cent are suffering from complications, and 39.4 per cent are dead. The use of sounds and forced cystoscopy in strictures of tuberculous nature is condemned, since this may occasion miliary tuberculosis.—*Das Resultat der Behandlung der Nierentuberkulose in der chirurgischen Universitätsklinik zu Upsala, insbesondere mit Rücksicht auf die Entstehung von Miliartuberkulose nach Cystoskopie und Sondierung, A. Westerborn, Arch. f. Klin. Chir., 1926, cxxxix, 699.*—(*H. J. C.*)

Addison's Disease with Report of Cases.—The cases reviewed were seen in a private practice in Colorado Springs. Since the most frequent of lesions producing this symptom is suprarenal-gland tuberculosis, it would be expected that the incidence of this disease would be more frequent in regions where there is much tuberculosis, such as the health resorts of Colorado. This expectation is substantiated, for the census statistics for the entire registration area of the United States over ten years, 1912–1921, show a mortality from Addison's disease of 0.4 per 100,000, while that in Colorado averaged 1.2 per 100,000, or about 3 times the normal rate. This report is based on 7 cases, the youngest patient being 14 years old, the oldest 70. All but two had been treated for some form of tuberculosis from two to thirty years prior to the onset of the Addisonian syndrome. These two exceptions were the youngest of the series and one had been intensively exposed to infection since birth. The onset was gradual in all but two cases, and the first symptom noted in four was asthenia. In all cases there was pigmentation of the skin and mucous membranes, which was generally progressive. Hypotension occurred in all but one case, the lowest recorded pressure being 68/36. In every case there were gastrointestinal symptoms, nausea and vomiting being most frequent, diarrhea less so. Abdominal and lumbar pain occurred in three cases. In all but one case attempts were made at some form of substitution therapy, orally or hypodermatically, without apparent marked relief except in one case. In one case suprarenal substance seemed to accentuate all symptoms, whereas pituitary extract alleviated them. The duration of symptoms varied from two to twelve months, the average being seven months. The average duration of the disease is generally stated to be two to three years. Autopsies were secured in 3 cases, all of which showed virtually complete destruction of the suprarenals by tuberculous lesions. In one patient there was marked hypoplasia of the heart and genital anomalies. *Comment and Deductions:* It seems likely that lesions of the suprarenal bodies are more frequently associated with manifest tuberculosis elsewhere than has been supposed and may account for persistent asthenia, hypotension and gastrointestinal symptoms. In cases with such symptoms some form of suprarenal therapy should be considered. Ghon, in 19,061 autopsies at Prague, according to Schwartz, has found demonstrable suprarenal tuberculosis in 0.4 per cent, and the estimated percentage for the tuberculosis cases is 2.4 per cent. In generalized miliary tuberculosis, among 20 cases, 17 showed suprarenal lesions, or 83 per cent, some of them, however, only demonstrable by careful serial section. In therapy it is most logical to use preparations of the whole gland, fortified if necessary by additional injections of epinephrin.—*Addison's Disease with Report of Cases, W. H. Swan and L. W. Bortree, Boston M. & S. J., April 22, 1926, cxciv, 712.*—(*A. P.*)

Relation of Tuberculosis of Skin and Eye to Pulmonary Tuberculosis.—Among 17,000 cases of pulmonary tuberculosis skin tuberculosis was found only 29 times, while there were only 2 cases of tuberculosis of the eye. On the other hand, pulmonary findings were obtained in 78 per cent of all the cases of skin tuberculosis, the condition being of fibroid nature with favorable course; the same was found to be true in ocular tuberculosis. Lupus and tuberculosis of the eye were frequently found combined in the same individual.—*Über den Verlauf der Lungentuberkulose bei der Tuberkulose der Haut und der Augen, E. M. Witkina and O. A. Maklakova, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 119.*—(*H. J. C.*)

Visceral Tuberculosis and Skin Disease.—Patients with tuberculosis of the internal organs seldom have skin tuberculosis. Men with visceral tuberculosis are rarely bald-headed; as a rule they have more hair than the nontuberculous. Other skin characteristics are prominent in the tuberculous, such as those of the nails and sweat glands. It is possible that the skin has a special resistance in these patients. The skin is a protective organ. In men with visceral tuberculosis the eye-lashes are thicker than normal. Two cases are described in which women developed much hair on the extremities following the development of pulmonary tuberculosis. Nontuberculous skin diseases are not common in the presence of visceral tuberculosis.—*Viszeraltuberkulose und Hautorgan, R. Wigand, München. med. Wchnschr., May 7, 1926, lxxiii, 769.*—(*E. R. L.*)

Treatment of Pulmonary Tuberculosis.—The value of fresh air in sickness appears to have been recognized long before George Bodington, an early advocate of the open-air and exercise treatment of tuberculosis, published his book in 1840. Benjamin Franklin, writing about the year 1786, says: "Physicians after having for ages contended that the sick should not be indulged with fresh air, have at length discovered that it may do them good." Open air in the treatment of phthisis should be as complete as possible, but sun, unless the air is cold, is safest avoided by patients with active lung disease. A prolonged sunning may lead to undesirable congestion of the tuberculous areas. Tuberculous patients do best in a dry climate, but climate is secondary to open air. *Rest and Exercise:* To Brehmer and Dettweiler belongs the credit of recognizing the importance of the regulation of rest and exercise. There is universal agreement that cases decidedly febrile must be kept at rest as long as fever persists; beyond that point differences of opinion and practice exist. Continental sanatoria advocate rest, rather to the avoidance of exercise while British institutions enforce less rest and make exercise a part of the routine. In chronic, fibroid disease mild reactions and a full blood-supply seem in many cases to promote healing, but in acute, caseous, or "exudative" cases reaction and congestion may lead to softening. In patients with caseous areas of any extent exercise should not be allowed until disease is fully quiescent; and since most cases of tuberculosis are of mixed type and contain some areas of caseous disease, exercise should be regarded as a somewhat dangerous measure until all evidence of activity is past. Rest in bed must be carried on, under open-air conditions, until all fever has gone, and as long afterward as symptoms and signs suggest that the disease is still active. The possible need of collapsing the lung in progressive cases must not be neglected till too late. When the disease is arrested the patient should be got slowly but steadily back to normal exertions, and five to ten miles of walking exercise daily is not too much to end up with. But this must be slowly and steadily achieved with the eye on the temperature chart. At the same time the patient most have some hours of complete rest on couch or easy chair during the day. *Tuberculin:* A well-applied course of tuberculin does good in suitable cases, but the treatment has gone out of fashion here largely on account of the trouble involved to both physician and patient. If it had been the remarkable remedy some have held this would not have happened. If it is used, marked reactions should be avoided. The treatment is useful in those quiet chronic types for which graduated exercise may be employed with impunity. *Chemotherapy.* It has long been known that potassium iodide, arsenic, creosote, and some other drugs may cause focal "reactions" in certain cases; of recent years attention has been directed to the salts of the heavy metals, especially of copper and gold. Copper salts were used in very early days, and their use was revived in France by the Lutons about 1880. Various preparations were used by mouth, subcutaneously, and intraveneously. These experiments seemed to bring out two important facts: (1) a selective action possessed by copper for tuberculous tissues, and (2) the apparent ability to get copper into contact with tuberculous tissues by general administration and to cause reactions. These reactions were followed by improve-

ment in some cases, but in others by none. Gold therapy may be said to date from Koch, who in 1890 discovered that gold salts possessed an inhibitory action on the growth of the tubercle bacillus *in vitro*. DeWitt of Chicago, from an analysis of the organs of healthy and tuberculous guinea pigs treated with *krysolgan*, concludes "that gold has shown no specific affinity for tuberculous tissues." In 1924 Moellgaard of Copenhagen claimed that *sanocrysin* would diffuse through the nonvascular tuberculous tissues, penetrate the fatty capsule of the bacillus, and attack it *in situ*. Various results, some good and some bad, have so far been reported, and the method is still under trial. Whether we are here dealing with a true chemotherapy, or only a treatment by reactions, still remains to be proved. Treatment by reactions, however induced, should be pursued with caution, and must not be applied to exudative or caseous cases. If a true chemotherapy is obtained with gold or other heavy metals, then some risks may be justifiably run during the destruction of bacilli in areas of active disease. *Therapeutic Pneumothorax:* Although Carson of Liverpool realized the benefits to be gained by collapse of a diseased lung as long ago as 1821, treatment by artificial pneumothorax was only seriously started with the publication of cases by Forlanini in 1894 and 1895. The cases for which it is suitable fall into two categories: (1) those of active disease which strict recumbency has failed to arrest, and (2) those in which cavitation and extensive disease have rendered healing impossible in the functioning lung. To these may be added cases of severe recurrent hemoptysis. In the main, disease must be unilateral. Under pneumothorax treatment the functioning lung improves rather than deteriorates. The chief trouble in pneumothorax treatment is the very common presence of pleural adhesions, which tend to limit collapse. When pneumothorax treatment fails, owing to adhesions, there remains the possibility of bringing about collapse by surgical measures. *Surgical Treatment:* Thoracoplastic operations date from de Cerenville of Lausanne in 1885. The modern operation, a paravertebral resection of ribs, is especially associated with the names of Sauerbruch, Wilms, Brauer and Saugman. Sometimes the operation is preceded by phrenicotomy to paralyze the diaphragm. The main danger is aspiration pneumonia, and phrenicotomy is thought to help in avoiding this. The results of these operations in skilled hands have been highly encouraging, but they can only be performed in carefully selected cases. In certain *important complications* a few principles of treatment are mentioned: for hemoptysis, morphine, in the usual doses; but a large dose of sodium bromide is better. The danger of hemoptysis lies more in the retention of blood in the lungs, leading to pneumonia or further spread of tuberculosis, than in the quantity of blood expectorated; consequently, it is of the utmost importance that the cough reflex be not abolished by drugs, such as morphine in large doses. Fever we must regard as evidence of toxemia, to be reduced by all those means in our power which lessen autoinoculation. Cough is apt to disturb healing and to increase autoinoculation. The patient must learn to restrain it.—*A Lecture on the Principles of Treatment of Pulmonary Tuberculosis, C. Riviere, Brit. M. J., May 1, 1926, no. 3409, 771.*—(*F. M.*)

Key to Abstractors

A. P.: Andrew Peters, Loomis, N. Y.
C. E. A.: C. E. Atkinson, Banning, Cal.
E. R. L.: Esmond R. Long, Chicago, Ill.
E. H. K.: E. H. Kerper, Loomis, N. Y.
F. M.: Francis Murray, Loomis, N. Y.
H. J. C.: H. J. Corper, Denver, Col.
H. S. W.: H. S. Willis, Baltimore, Md.
M. P.: Max Pinner, Northville, Mich.
U. E. Z.: U. E. Zambarano, Northville, Mich.